TITLE: **SABRE™ X-Axis Lead Screw Replacement Procedure**

Gerber FastFact #: 2013

Supplied by: Gerber Hardware Support

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Summary: The following procedure explains how to replace the X-Axis lead screw on a Sabre 404 or 408 Router.

Tools used:

- Metric Allen Wrench set – "Long-L" type
- Metric Allen Wrench set – "T handle" type
- Torque Wrench – *INCH POUND*
- Open End Wrench – 17mm
- Socket for Torque Wrench – 15mm for Lead screw bolts, ¼" for Chapman bits
- Metric Chapman Drive set
- Light duty thread locking compound. LocTite 222 or equivalent and LocTite 245 or equivalent
- Medium duty thread locking compound. LocTite 242 or equivalent
- Isopropyl alcohol for clean-up

Referencing 0,0 position

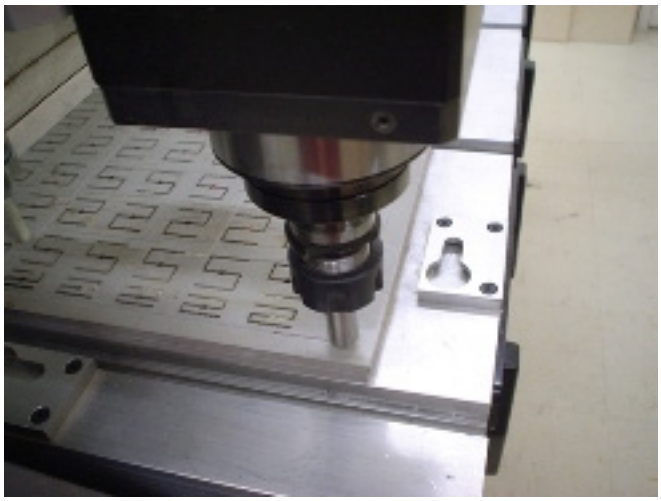
In order to ensure that the encoder pulse is set to original position after new screw is installed it is advised before removing old X screw to use the pen tool to draw a line in the Y direction on the table top to use in setting the new screws 0 position. Follow the steps below to do this before removing old screw.

Note: In the case of an inoperable lead screw, see fast fact #2042, "Establishing the X-Axis encoder pulse position."

To Reference 0,0 position

1. Turn the Sabre on at the controller.
2. Orient system.
3. Place pen tool in spindle motor (without moving beam from position it stopped at when it finished orienting).
4. Lower Pen tool to Table top to depress spring in pen so it can draw on table top.

5 Slew pen in Y direction leaving a line at least 10″ long.



Removing the lead screw from the beam and carriage

To remove the lead screw from the beam and carriage

1 Move the beam to the front of the table and the carriage to the center of the table.

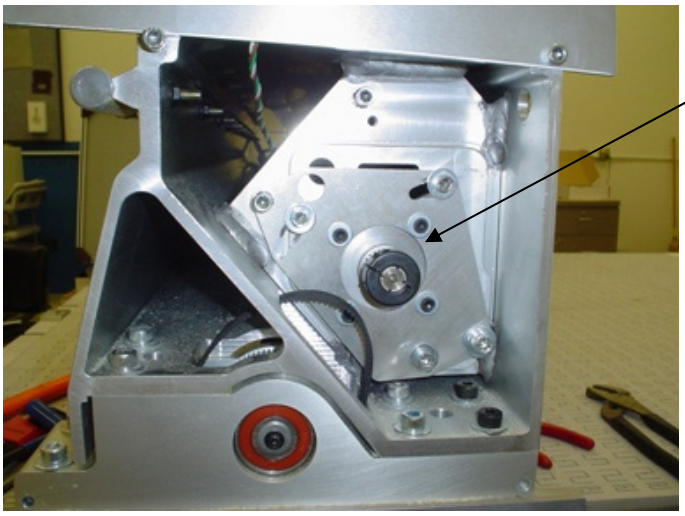
2 Turn off the router and unplug the power cord.

3 Remove the left and right beam end covers (four 5mm screws each side). Be careful of the emergency stop switch wires. Temporarily attach the end covers to the beam ends with one screw.

4 Inside the right end of the beam, loosen the motor plate screws (three 5mm and one 6mm).

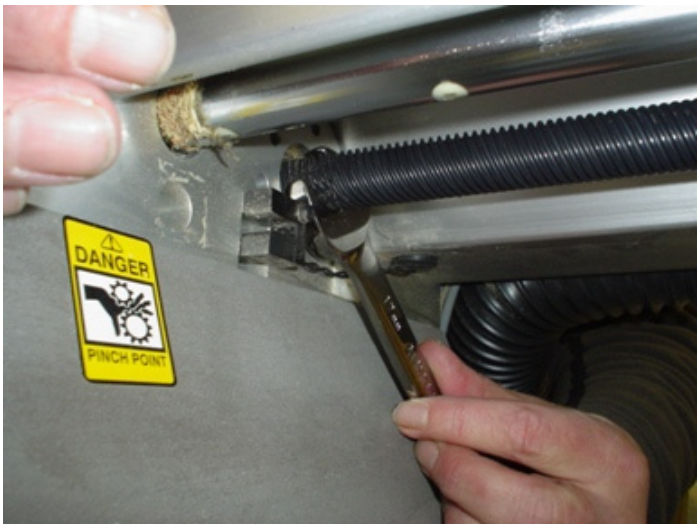
5 Remove the spring (needle nose pliers) on the plate to take the pressure off the motor plate and to release the tension on the spring.

6 Pivot the motor plate assembly down & to the left to remove the belt between the motor pulley and the lead screw pulley.



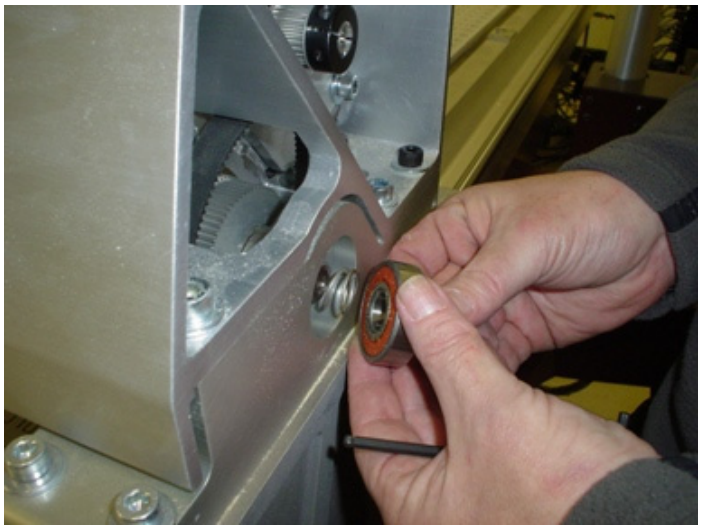
7 Put a wrench (17mm) on the flats (left side of the machine) of the left end of the lead screw.

Note: You will need assistance to hold the wrench..

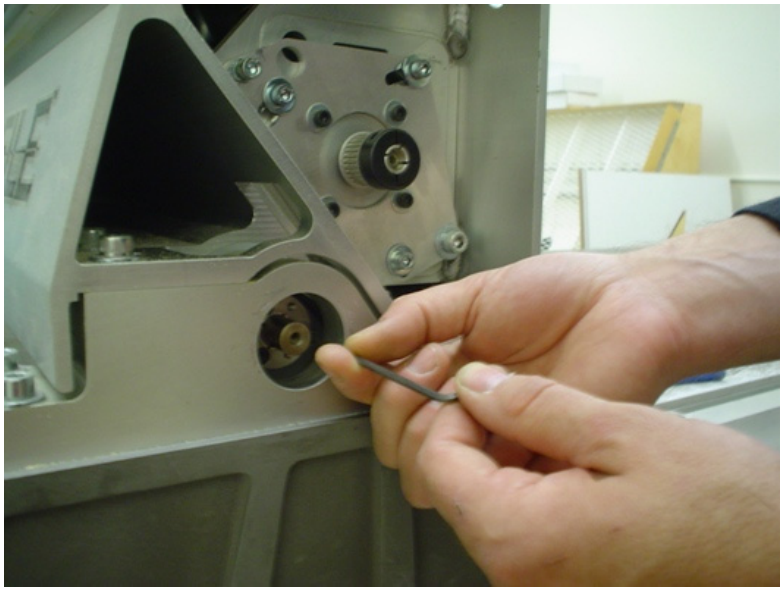


8 On the right end of the lead screw, remove the button head screw (4mm) securing the bearing to the right end of the lead screw. Be careful not to strip this screw.

9 Remove the bearing and spring from the right end of the beam casting.

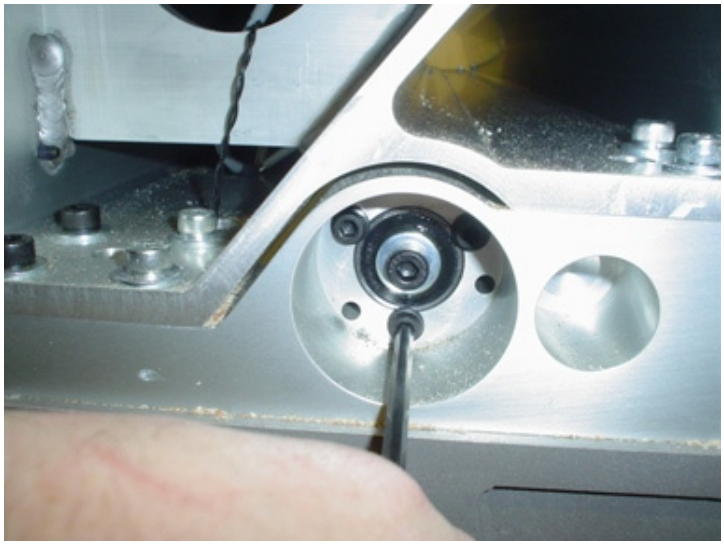


10 Inside the right end of the beam, remove the three screws (3mm) holding the pulley shaft clamp to the pulley. Be careful not to let the screws fall inside the housing.



11 Insert the three screws in the smaller threaded holes in the pulley shaft clamp (not one of the holes you just removed the screws from). The screws should be tightened equally, in stages – this operation frees the friction fit of the pulley built in clamp. If one screw is tightened all the way first, it is possible to lodge the pulley crooked on the internal clamp making removal very difficult.

12 Inside the left end of the beam, remove the three screws (5mm) holding the left bearing in the beam bearing housing.



13 Remove the wrench from the flats of the left end of the lead screw.

Note: At the same time as you do step 14, have someone insert a small Allen wrench into the right end of the beam where the lead screw is being removed to keep the pulley, clamp, and belt from falling inside the housing.

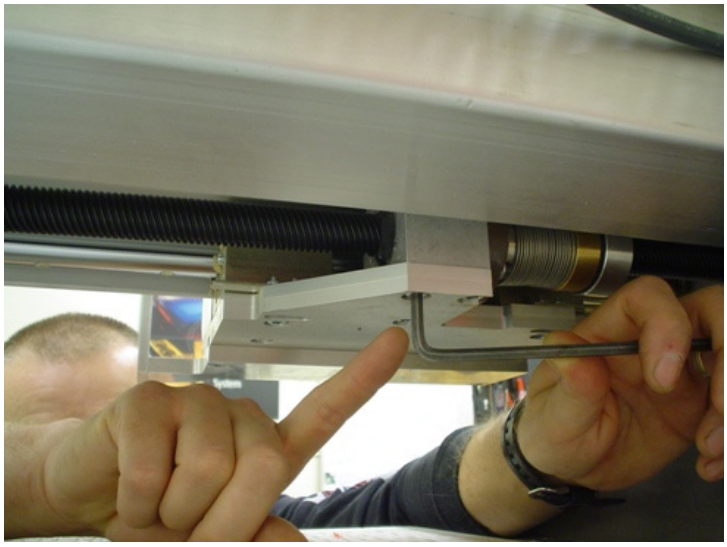
14 Slide the lead screw to the left out of the pulley and clamp so that it protrudes approximately 6" out of the left side of the bearing housing.

15 Put a wrench (17mm) on the flats of the left end of the lead screw and remove the screw (6mm) holding the bearing to the lead screw.

16 Remove the inner bearing from the right side of the lead screw.

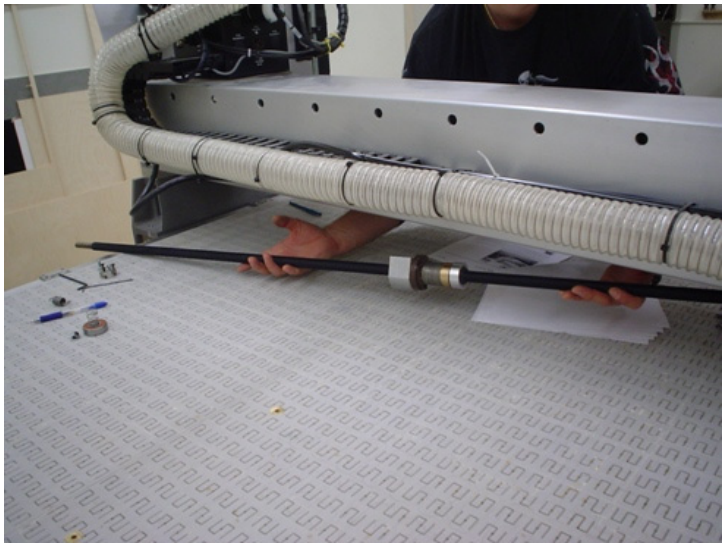
17 Slide the lead screw to the right so that it protrudes approximately 3″ out of the right side of the bearing housing.

18 Under the carriage, remove the three screws (5mm) holding the lead screw nut block to the bottom plate. Now the carriage is disconnected from the leadscrew, centered on the table and out of the way of the left and right side mechanical operations.

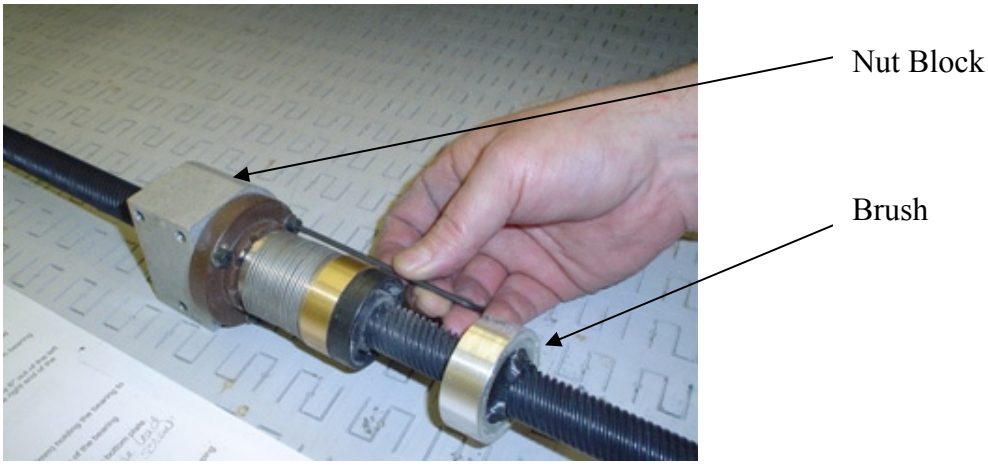


19 Lift and support the right side of the lead screw, then slide the carriage to the right side of the beam stopping approximately 5 inches from the end of the beam.

20 Lift the right side of the lead screw and move it toward the left of the table so that it clears the plate on the bottom of the carriage. While the lead screw is angled down and towards the rear, slide the left end of the lead screw out of the left end of the bearing housing.



21 Remove the right side brush. Install on new lead screw.



Installing the lead screw in the beam and carriage

To replace the lead screw from the beam and carriage

1 Slide the left end of the new lead screw into the left side of the beam so that it protrudes out of the left side of the bearing housing.

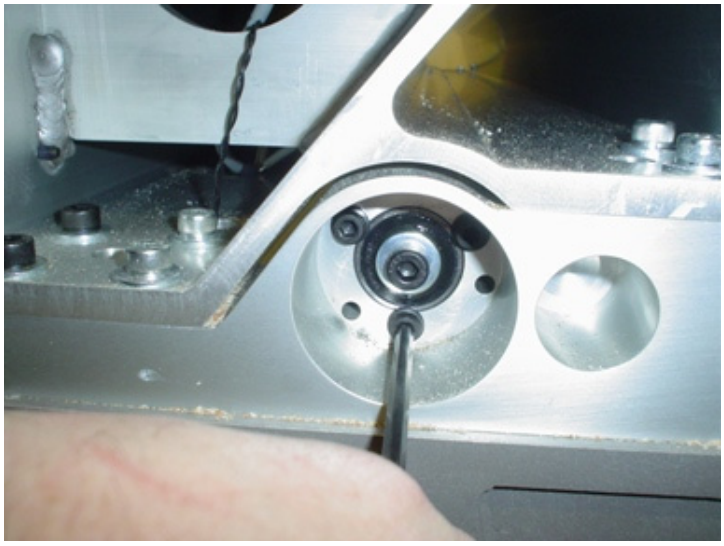
2 Lift the right end of the lead screw and move it towards the right of the table so that it goes through the plate on the bottom of the carriage. The lead screw should protrude out of the left side of the bearing housing approximately 3″.

3 Insert the bearing on the inner right side of the bearing housing, and push the lead screw towards the right side until it is flush with the bearing. You should have someone remove the small Allen wrench from the right end of the beam and insert the pulley.

Note: Ensure that the notch in the bearing lock ring is aligned with the right limit switch.

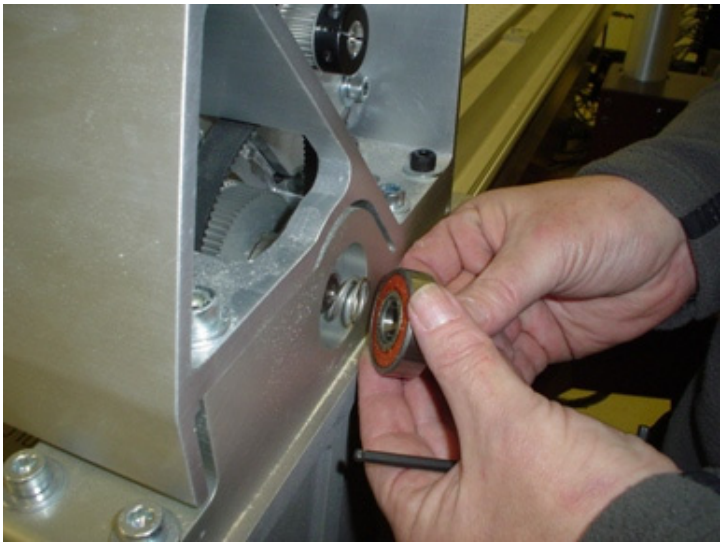
4 Put a wrench (17mm) on the flats of the left end of the lead screw and insert the screw (6mm) holding the bearing to the lead screw.

5 Clean the three screws (5mm) that hold the left bearing in the beam bearing housing with alcohol, install the screws applying a dab of Loctite 242 to the threads. Torque the screw holding the bearing to the lead screw to 88 inch lbs.



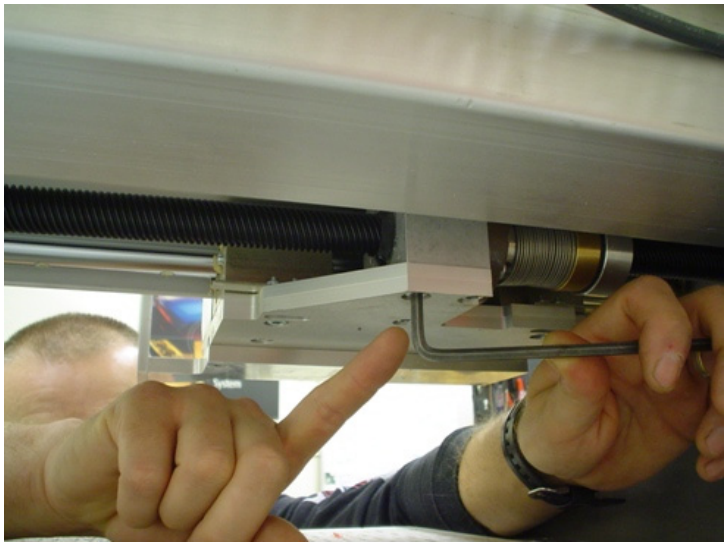
7 With the wrench still on the flats of the lead screw, place a .03 feeler gauge (thickness of credit card) between the beam housing and pulley. Tighten the screws (3mm) that hold the pulley clamp to the shaft. Insert the spring and bearing into the right end of the beam casting.

8 Compress the spring by pushing the bearing in and insert and tighten the button head screw (4mm) that secures the bearing to the right end of the lead screw. Remove feeler gauge. Torque the screw to 212 in-lbs. Make sure that .030 clearances has been maintained.



9 Make sure the belt is off the motor pulley and the lead screw pulley.

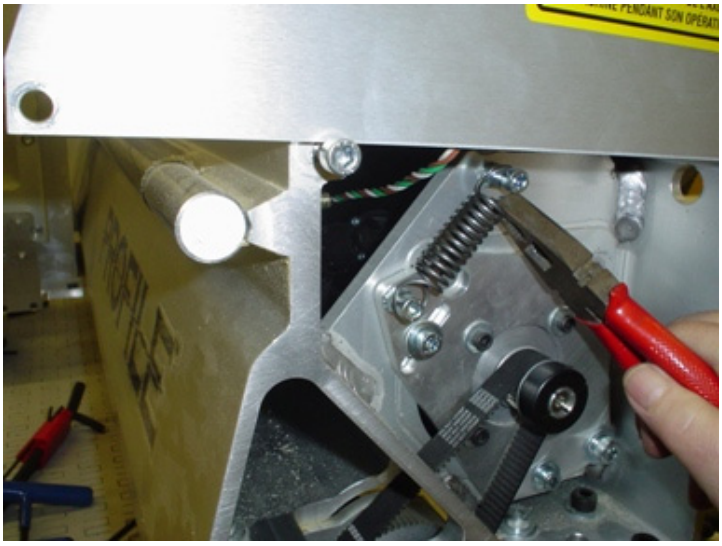
10 Push the carriage so as to seat the nut block, remove the three nut block screws, and clean and apply a dab of loctite 222. Tighten the three nut block screws holding the nut block to the bottom plate in a staggered order (the way you tighten the lug nuts on a car tire rim.)



11 Push the carriage all the way to the right, then all the way back to the left. Repeat this movement several times. The carriage should not bind on the lead screw. If binding occurs, it normally happens near the left or right end. If there is binding:

- ♦ Remove the three screws securing the lead screw nut to the nut block.
- ♦ Turn the lead screw nut 120 degrees and align the holes in the lead screw nut with the holes in the nut block.
- ♦ Secure the lead screw nut to the nut block with the three screws.
- ♦ Loosen the three screws securing the nut block to the bottom plate, and then retighten them in a staggered order.
- ♦ Push the carriage all the way to the right and left to verify that the carriage does not bind on the lead screw. If there is still binding, repeat step 3.
- ♦ If there is no binding, tighten the three screws securing the lead screw nut to the nut block. These screws are purposely left loose during manufacturing of the lead screw assembly to facilitate alignment during installation and must be tightened to complete the procedure.

12 Pivot the motor plate assembly to reinsert the belt between the motor pulley and the lead screw pulley. Do not tension the belt manually; install the spring that will apply the correct tension for the belt. Tighten the screws in the motor plate.



Verifying the encoder pulse position

To verify the encoder pulse position

1 Plug in and turn on the router.

2 Slew the beam to approximately 1″ from the front of the table. Slew the carriage to approximately 1″ from the left side of the table.

3 Orient the Sabre.

4 Once the Sabre has oriented, without moving the beam place the pen tool in the Spindle. Lower pen tool to tabletop and depress the spring so the pen will draw. Slew pen in Y direction. If new pen mark is in the same place as original, encoder is ok. If pen line is off in either direction of original pen line, follow steps below.

5 Inside the right end of the beam, loosen the motor pulley clamp.

Note: You may need assistance with step 6.

6 Manually rotate the pulley belt so the carriage moves the pen over the original registration mark. Tighten the motor pulley clamp. Do not align the slot in the motor pulley clamp with the slots in the motor pulley.

7 Turn off the router, and then perform steps 2-6 until the X is correct. You may have to do this several times to get the correct position.

8 Install the left and right beam end covers (four 5mm screws each side). Be careful of the emergency stop switch wires.